



3151 系列 智能压力变送器

3151 series
Smart pressure transmitter



产品简介

3151 系列智能压力变送器作为一种高精度智能型的现场压力参数的检测仪表，可以用来测量各种介质在液体、气体和蒸汽状态下的差压、压力、液位等参数，与节流装置配合还可以测量流体的流量参数，并将被测的压力参数转换成 4-20mA 标准电信号输出，该输出可作为指示、记录和各种控制、调节系统的输入信号，变送器同时采用 HART 协议传输数字信号，具有与手操器或上位机进行通讯的功能，变送器具有输出参数组态功能，能适应不同用户的需要。它可以精确地测量小差压至大差压、低压力至高压、液位、真空度和比重。DP / GP 型压力 / 差压变送器配上远传密封装置后，可避免被测介质直接与变送器的隔离膜片接触，对不能直接进行测量的介质提供了一种可靠的测量方法。

本产品外形精巧，重量轻，测压接口兼容 3151 普通型智能差压 / 压力变送器，可全系列替代市场上广泛使用的 1151、3051 系列模拟式或智能式差压 / 压力变送器使用。

Brief introductions of products

3151 series smart pressure transmitter is a high-accuracy intelligent type field pressure parameter inspection instrument, can measure differential pressure, pressure and liquid level of various medium in liquid, gas and vapour. It can also measure the flow rate parameter of the liquid when matched with throttling devices, and transfer the measured pressure parameter into 4-20mA standard electric signal output. The output can be used as the input signal of indication, record and various control and adjust system. The transmitter adopts HART protocol to transmit digital signal, can communicate with hand operated device or PC, it can also output parameter configuration which can meet different user requirements. It can measure precisely from micro differential pressure to large differential pressure, from low pressure to high pressure, as well as liquid level, vacuum and proportion. When matched with remote transmission sealing device, DP / GP type pressure / differential pressure transmitter can prevent measured medium from contacting the isolation diaphragm, which supply reliable measuring modes for medium that can't be measured directly.

This product is with light weight, the pressure measuring interface is compatible with 3151 ordinary type smart differential pressure / pressure transmitter, which can replace the market widely used 1151, 3051 series analog or smart differential pressure / pressure transmitter.

产品特点和工作原理

3151 系列智能压力变送器有以下特点：

- 1、完整的变送器系列：包括差压、压力、绝对压力、法兰和远传等系列变送器。
- 2、完整的测量范围：0-0.15kPa~42MPa。
- 3、采用固体、插接式印制线路板。
- 4、结构小巧、坚固、抗振。
- 5、非接触式就地零点、量程调整和 LCD 液晶显示参数组态按钮。
- 6、模块化结构。
- 7、阻尼可调。
- 8、多种选择、应用灵活。
- 9、智能电路。
- 10、具有独立抗电磁干扰电路和软件抗干扰设计。

3151 series smart pressure transmitter has the following features:

- 1、Complete transmitter series: including differential pressure, pressure, absolute pressure, flange and remote transmission series transmitter
- 2、Complete measuring range: 0-0.15kPa~42MPa
- 3、Adopt solid, plug-in type printed wiring board
- 4、Small and solid structure which is shakeproof
- 5、Non-contact onsite zero button, range adjustment button and LCD parameter configuration button
- 6、Modularized structure
- 7、Adjustable damping
- 8、Various models and flexible application
- 9、Smart circuit
- 10、With independent anti-electromagnetic interference circuit and software anti-interference design.





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工业领域领先的性能和特性:

3151 系列智能变送器可准确测量流量液位、表压、绝压、真空度和比重。具有全金属密封的差动电容压力传感器的 δ 室结构创新设计, 使差压 (压力) 和温度测量实现了重大改进和良好的稳定性。

小巧的设计, 一体化接线盒和本机零点和量程调整和 LCD 显示组态按钮, 使安装、校验和运行简化。

外壳具有通用符合 IP65 标准防护型及防爆型两种可供选择。电路板与接线分离成为两个室结构。大多数型号, 都可提供腐蚀性场合所用的 316L SST 或钽, 哈氏合金 c 等防腐性材料。模块化结构和插拔式线路板有助于故障检修及减少备件库存。

advanced performance and features among industrial field:

3151 series smart transmitter can measure precisely liquid level, gauge pressure, absolute pressure, vacuity and proportion. With innovate δ chamber design of differential capacitive pressure sensor which is all mental sealed.

Flexible design, unified junction box, zero location and range adjustment button, LCD paramemter configuration button makes it easy to install, calibrate and operate.

The sell is optional between IP65 standard protection type and explosion proof type. Circuit board and wiring are separated into two-chamber structure. For most models, 316L, SST, tantalum or Hastelloy alloy-c are available in corrosive places. Modularized structure and plug-in type circuit board help to repair and reduce spare parts.

工作原理

3151 系列智能压力变送器工作原理框图见图 1。

Working principle diagram of 3151 series smart pressure transmitter is seen in picture 1.

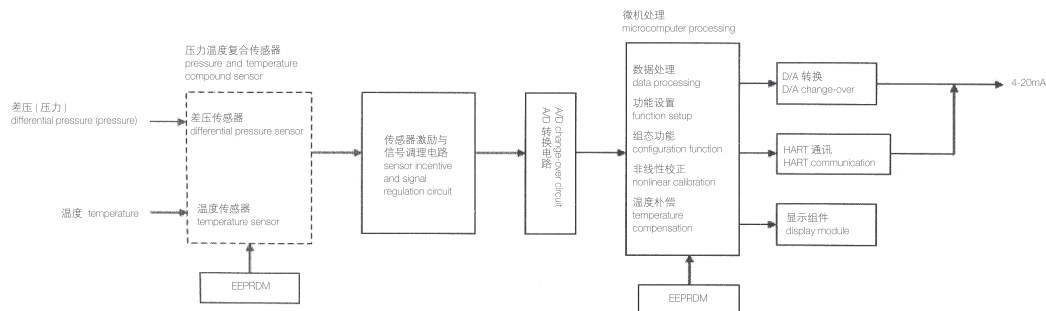


图 1 3151 系列智能压力变送器工作原理框图

Picture 1 3151 series smart pressure transmitter working principle diagram

被测介质的压力作用于压力、温度复合传感器上的 δ 室的正压端隔离膜片 (LT 型液位变送器和带毛细管的 DP / GP 远传型变送器则是被测压力先经过一次隔离膜片和充满硅油的全密封的毛细管系统再被传到 δ 室的隔离膜片) 再通过 δ 室中的灌充硅油传递到中心的测量膜片上使其产生相应的位移, 测量膜片是一种预张紧的弹性元件, 其位移与被测介质的压力成正比, 最大的位移量约为 0.08mm, 测量膜片的位置变化由它两侧的电容固定极板通过电容量的变化检测出来。使传感器的测量膜片和两固定电容极板的电容量发生变化。除 AP 型绝对压力变送器, 其测量膜片的另一侧 (负压端) 是绝对真空基准点外, 其它品种的测量膜片的负压端与被测差压的低压侧或大气相通。在 δ 室的正压端嵌有高精度的温度传感器, 用于检测传感器本体的温度变化, 由于 δ 室的正压端与被测介质直接接触, 所以同时可获得与传感器所接触的介质的温度信息。

Pressure of measured medium acts on the positive pressure end isolation diaphragm of the pressure and temperature compound sensor δ chamber, and then transfers to the central measuring diaphragm through filling silicon oil in δ chamber, to make corresponding displacement. Measuring diaphragm is pretension elastic element of which the displacement is in direct ratio to the pressure of measured medium, the max displacement is about 0.08mm, the measuring diaphragm location variation is detected out through the capacitance variation of the capacitance fixed polar plate. The negative pressure end of other type of measuring diaphragm is interlinked with the measured differential low pressure end or the atmosphere, except the AP type absolute pressure transmitter of which the measuring diaphragm's negative pressure end is absolute vacuum datum point. There is high-accuracy temperature sensor in the positive end of the δ chamber, to detect the temperature variation. The positive end of the δ chamber contacts the measured medium directly, thus, you can obtain temperature information of the medium that contacts the sensor.

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传感器的电容量变化,通过特定的高频激励与检测电路将其转换为直流电信号,通过信号调理电路转换为一定幅度的电压信号,经 A/D(模拟/数字)转换为数字量的信号送至 CPU 处理,所检测到的温度信号同样转换为数字信号送至 CPU 处理、上述两个信号经微处理器的程序运算,并经 D/A(数字/模拟)转换以及 HART 通信电路处理,将压力及温度参数转换成所需的 4~20mA 标准直流电流信号及符合 HART 协议的数字信号并调制在二线制电流信号上,提供给用户使用,同时驱动显示器显示。变送器内置的微处理器在计算机程序(软件)的支持下完成所需的特定功能。

在变送器的传感器组件与 CPU 电路板上设置了专门用于存储传感器特征信息的存储器芯片,用于传感器出厂特征数据的保存,实现关键参数冗余保护及便于传感器组件与 CPU 电路板的更换。

High frequency incentive and detection circuit transfer the sensor capacitance variation to direct current electric signal, turn to pressure signal of some amplitude through signal regulation circuit, switch to digital by A/D(analog / digital) and then send it to CPU. The detected temperature signal is turned into digital signal as well and sent to CPU. The above two signals are operated by microprocessor, switched by D/A(digital/analog) and processed by HART communication circuit, then, transfer temperature and pressure parameters to 4~20mA standard direct current signal and digital signal in accordance with HART protocol, and, modulate them to two-wire system current signal, supply them to users, at same time, drive the displayer to display. The inner set microprocessor completes special functions with help of the computer program.

There is memorizer chip set inner the sensor assembly and CPU circuit board that is for storing information of sensor characteristics specially, to store the original set data, realize key parameter redundancy protection, and be easy for change-over between sensor assembly and CPU circuit board

产品基本性能及主要功能

1. 测量参数类型:
差压、表压、绝对压力任意选择一种
2. 测量范围:
差压: 0-0.15kPa~7 MPa(按不同的量程段选择传感器)
表压: 0-0.1 5kPa~42 MPa(按不同的量程段选择传感器)
绝压: 0-40kPa~7 MPa (按不同的量程段选择传感器)
3. 与传感器接触的介质温度范围: -40~85℃
4. 显示参数
测量压力值
输出模拟电流值
被测压力对应设定量程的百分比值
传感器本体与其接触介质的温度值
5. 输出信号:
1)4~20 mA Dc 压力参数模拟信号与压力、温度数字信号,使用 HART 协议。
2)压力、温度、百分比量程全数字信号,使用 EPA、FF、或 Profibus-PA 现场总线协议。
6. 主要组态功能
零点迁移、量程、工程量单位、阻尼时间、超限报警、输出 4~20 mA 电流标定、写数据保护、输出函数、出厂数据恢复。
7. 防爆等级: ExdIICT6(隔爆型)
Exia II CT6(本质安全型)
8. 外壳防护等级: IP65

Products performances and functions

- 1.Types of measuring parameter:
Differential pressure, gauge pressure, absolute pressure are optional
- 2.measuring range:
Differential pressure: 0-0.15kPa~7 MPa(select proper sensor according to different ranges)
Gauge pressure: 0-0.1 5kPa~42 MPa(select proper sensor according to different ranges)
Absolute pressure: 0-40kPa~7 MPa (select proper sensor according to different ranges)
- 3.Temperature range of the medium contacting the sensor: -40~85℃
4. parameters
measuring pressure
output analog current
Percentage of the setting range corresponding to tested pressure
Temperature of the sensor body and the contacted medium
- 5.output signal:
1)4~20mA DC pressure parameter analog signal, pressure and temperature digital signal are with HART protocol
2)Pressure, temperature, percentage range digital signal are with EPA、FF、or Profibus-PA field bus protocol
6. main configuration function:
Zero shift, range, engineering unit, damping time, ultralimit alarming, output 4~20mA current calibration, write data protection, output function, factory data recovery
- 7.Explosion proof grade: ExdIICT6 (explosion-proof type)
Exia II CT6(intrinsic safety type)
- 8.Enclosure protection class: IP65





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产品主要技术性能指标

Main technical performance indications

1.3151 系列智能差压变送器可调量程范围、推荐使用量程范围、量程上下限、最大工作压力、基本误差见表 1。

1.3151 series smart differential pressure transmitter adjustable measuring range, recommended measuring range, upper and lower limit of range, maximum working pressure, basic error are shown in chart 1.

量程代码 Range code	可调量程范围 (kPa) adjustable range	推荐使用量程范围 (kPa) recommend-ed range	量程上下限 (kPa) Upper and lower limit of the range	最大工作压力 (MPa) max working pressure	基本误差 Basic error	准确度等级 Accuracy grade
DP 3	0-0.15~7.5	0-1.25~7.5	± 7.5	13.8	± 0.1% FS	0.1
DP 4	0-0.4~40	0-4~40	± 40	13.8	± 0.075% FS	0.075
DP 5	0-2~200	0-20~200	± 200	13.8	± 0.075% FS	0.075
DP 6	0-7~700	0-70~700	± 700	13.8	± 0.075% FS	0.075
DP 7	0-21~2100	0-210~2100	± 2100	13.8	± 0.075% FS	0.075
DP 8	0-70~7000	0-700~7000	± 7000	13.8	± 0.2% FS	0.2

2.3151 系列智能高静压差压变送器可调量程范围、推荐使用量程范围、量程上下限、最大工作压力、基本误差见表 2。

2.3151 series smart high static differential pressure adjustable measuring range, recommended measuring range, upper and lower limit of range, maximum working pressure, basic error are shown in chart 2.

表 chat 2

量程代码 Range code	可调量程范围 (kPa) adjustable range	推荐使用量程范围 (kPa) recommend-ed range	量程上下限 (kPa) Upper and lower limit of the range	最大工作压力 (MPa) max working pressure	基本误差 Basic error	准确度等级 Accuracy grade
HP 4	0-0.4~40	0 -4~40	± 40	31	± 0.1% FS	0.1
HP 5	0-2~200	0-20~200	± 200	31	± 0.1% FS	0.1
HP 6	0-7~700	0-70~700	± 700	31	± 0.1% FS	0.1
HP 7	0-21~2100	0-210~2100	± 2100	31	± 0.1% FS	0.1

3.3151 系列智能压力变送器可调量程范围、推荐使用量程范围、量程上限、基本误差见表 3。

3.3151 series smart pressure transmitter adjustable measuring range, recommended measuring range, upper limit of range, basic error are shown in chart 3.

表 chat 3

量程代码 Range code	可调量程范围 (kPa) adjustable range	推荐使用量程范围 (kPa) recommend-ed range	量程上限 (kPa) Upper and lower limit of the range	基本误差 Basic error	准确度等级 Accuracy grade
GP 3	0-0.15~7.5	0-1.25~7.5	7.5	± 0.2% FS	0.2
GP 4	0-0.4~40	0-4~40	40	± 0.075% FS	0.075
GP 5	0-2~200	0-20~200	200	± 0.075% FS	0.075
GP 6	0-7~700	0-70~700	700	± 0.075% FS	0.075
GP 7	0-21~2100	0-210~2100	2100	± 0.075% FS	0.075
GP 8	0-70~7000	0-700~7000	7000	± 0.2% FS	0.2
GP 9	0-210~21000	0-2100~21000	21000	± 0.2% FS	0.2
GP 0	0-420~42000	0-4200~42000	42000	± 0.2% FS	0.2

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4.3151 系列智能绝对压力变送器可调量程范围、推荐使用量程范围和量程上限、基本误差见表 4。
4.3151 series smart absolute pressure transmitter adjustable measuring range, recommended measuring range, upper limit of range, basic error are shown in chart 4.

表 chat 4

Table with 6 columns: Range code, adjustable range (kPa), recommend-ed range (kPa), Upper and lower limit of the range (kPa), Basic error, Accuracy grade. It lists specifications for models AP 4, AP 5, AP 6, and AP 7.

注：
表 1 至表 4 列出的基本误差是变送器采用 316L 不锈钢隔离膜片和灌充 DC200 硅油的条件下，在推荐使用量程范围内的基本误差，在其余量程时：
对推荐使用量程范围内的基本误差为 ± 0.075% FS 变送器，变送器的基本误差 (Fs)= ± {0.075+0.0075*[(变送器量程上限 / 变送器校验量程)-10]}%
对推荐使用量程范围内的基本误差为 ± 0.1% FS 变送器，变送器的基本误差 (Fs)= ± {0.1+0.01*[(变送器量程上限 / 变送器校验量程)-10]}%
对推荐使用量程范围内的基本误差为 ± 0.2% FS 变送器，变送器的基本误差 (Fs)= ± {0.2+0.01*[(变送器量程上限 / 变送器校验量程)-10]}%

Notes:
the basic error listed from chart 1 to chart 4 is under condition that the transmitter material is 316L stainless steel isolation diaphragm and filling DC200 silicon oil, the basic error within the recommended range are the following when out of the recommend ranges:
For transmitter of which the basic error is ± 0.075 % FS within the recommended ranges, the basic error(Fs) is ± {0.075+0.0075* [(transmitter range upper limit / transmitter calibration range)-10]}% when out of the recommended range;
For transmitter of which the basic error is ± 0.1 % FS within the recommended ranges, the basic error(Fs) is ± {0.1+0.01* [(transmitter range upper limit / transmitter calibration range)-10]} % when out of the recommended range;
For transmitter of which the basic error is ± 0.2 % FS within the recommended ranges, the basic error(Fs) is ± {0.2+0.01* [(transmitter range upper limit / transmitter calibration range)-10]} % when out of the recommended range;

5.3151 系列智能压力变送器电气技术性能见表 5。
5.3151 series smart pressure transmitter electric technical performances are shown in chart 5

表 chat 5

Table with 4 columns: power supply, 17.5~45V DC, output signal, 4~20mA DC+HART. It lists HART communication load (250~1500 Ω) and insulation strength (100V DC).

压力仪表系列
Pressure Instruments Series



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6.3151 系列智能压力变送器应用技术性能见表 6。

6.3151 series smart pressure transmitter applied technical performances are shown in chart 6

表 chat 6

变送器允许使用环境温度范围 Allowed working environment temperature range of transmitter	-40~85℃	带 LCD 显示变送器使用环境温度范围 working environment temperature range of transmitter with LCD display	-20~70℃
传感器极限接液温度范围 sensor limit temperature range of liquid connection	-40~104℃	传感器温度显示范围 sensor temperature display range	-40~125℃
变送器使用相对湿度范围 relative humidity scope of the transmitter	5% ~98%	稳定性 (1 年) Stability (1 year)	± 0.2%量程上限 Upper limit of range
差压变送器静压影响 static pressure influence of differential pressure transmitter	± 0.1% / 7MPa(零点 zero) ± 0.2% / 7MPa(量程 range)	环境温度综合影响 (零点与量程) comprehensive influence of ambient temperature(zero and range)	≤1% / 55℃

7.3151 系列智能压力变送器机械技术性能见表 7。

7.3151 series smart pressure transmitter mechanical technical performances are shown in chart 7

表 chat 7

传感器接液隔离膜片材料 sensor wetted isolation diaphragm material	316L SST	流程 (连接) 法兰螺纹 process (connection)flange thread	1 / 4-18NPT
泄放阀材料 release valve material	316 SST	流程法兰接头螺纹 (可选) Process flange joint thread (optional)	1 / 2-14NPT
过程法兰接头材料 process flange joint material	316 SST	电气盒接线连接孔螺纹 Electrical box wiring connection hole thread	1 / 2-14NPT
接液 “O” 型密封圈材料 wetted o-shaped sealing ring material	氟碳橡胶 Fluorinecarbon rubber	重量 (不含可选项) Weight(without options)	3.9kg
电气盒材料 electrical box material	低铜铝合金 low copper aluminium alloy	承压法兰螺栓材料 material of pressure-bearing flange thread	碳钢镀锌 galvanised carbon steel

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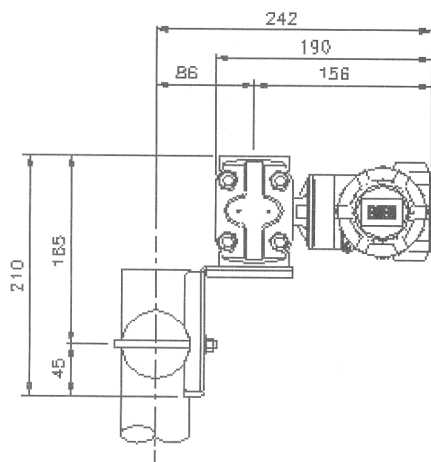
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产品选项介绍

以下为 3151 型变送器各种可选的选项，这些选项给应用带来了更大的灵活性。

安装支架 mounting bracket:

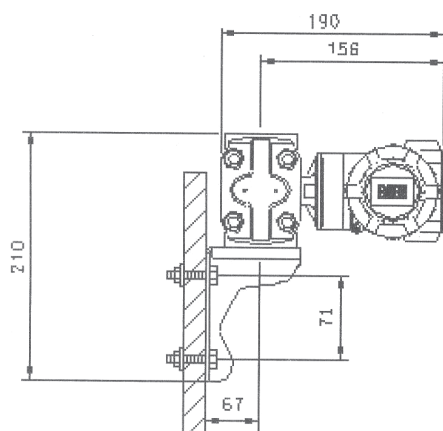


Introduction of production options

The following are various options of 3151 type transmitter which make more flexible application.

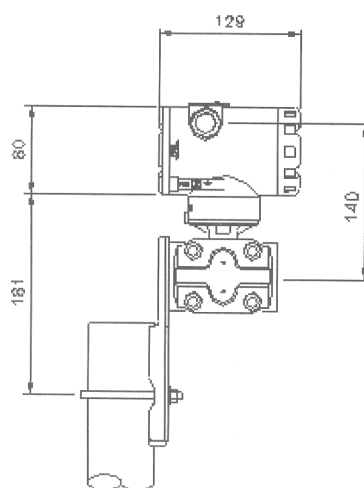
B1 2 英寸管道安装支架: 变送器安装于 2 英寸管道上的支架
碳钢结构, 配有碳钢 u 型螺栓, 聚氨酯喷漆

B1 2-inch pipe mounting bracket: bracket mounted on 2-inch pipe
Carbon steel structure, matched with carbon steel U-shaped bolt, painted polyurethane



B2 面板安装支架: 变送器安装于面板或墙上用的支架
碳钢结构, 配有碳钢螺栓, 聚氨酯喷漆

B2 panel mounting bracket: bracket mounted on panel or wall
Carbon steel structure, matched with carbon steel bolt, printed polyurethane



B3 2 英寸管道安装平支架: 变送器垂直安装于 2- 英寸管道上的支架
碳钢结构, 配有碳钢 U 型螺栓, 聚氨酯喷漆

B3 2-inch pipe flat mounting bracket: bracket mounted on 2-inch pipe vertically
Carbon steel structure, matched with carbon steel U-shaped bolt, painted polyurethane





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DP 型差压变送器

DP type differential pressure transmitter

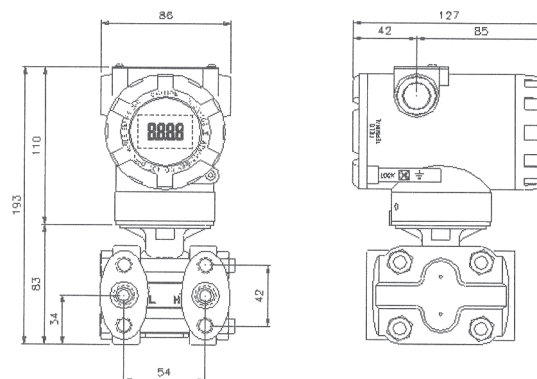
3151 系列
3151 series

3151 系列 DP 型差压变送器

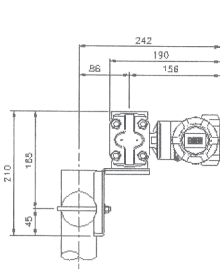
3151 series
DP type differential pressure transmitter



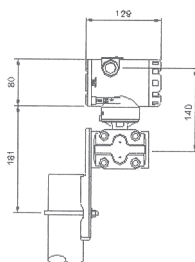
外形尺寸 overall dimension



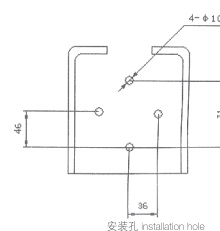
变送器使用的安装支架 mounting bracket for transmitter



B1 型托架
B1 type bracket



B3 型托架
B3 type bracket



B2 型托架 B2 type bracket

DP 型差压变送器
DP type differential pressure transmitter



3151 系列
3151 series

P-016

选型编码表 model selection code table

3151 系列代码 3151 series code		变送器选型代码 transmitter model selection code			选用项 options	
测量类型	DP	差压变送器 differential pressure transmitter				
可调试的量程范 (kPa) Adjustable measuring range	3	0-0.15~7.5	注, 使用 1kpa 以下量程须在订货合同中注明。 Mark out when range is below 1KPa			
	4	0-0.4~40				
	5	0-2~200				
	6	0-7~700				
	7	0-21~2100				
	8	0-70~7000				
推荐使用量程 (kPa) Recommended range	3	0-1~7.5				
	4	0-4~40				
	5	0-20~200				
	6	0-70~700				
	7	0-210~2100				
	8	0-700~7000				
输出信号型式 Outpur signal type	A	4~20mA 直流信号 +HART 协议数字信号 (单参数) DC signal+HART protocol digital signal(single parameter)			选用	
	B	4~20mA 直流信号 +HART 协议数字信号 (多参数) DC signal+HART protocol digital signal(multi parameter)				
	E	工业以太网协议的数字量信号 industrial Ethernet protocol digital signal				
	F	FF 基金会现场总线协议的数字量信号 FF bus protocol digital signal				
	P	Profibus-PA 协议的数字量信号 digital signal of bus-PA protocol				
与测量介质接触的部件材料 material of medium wetted parts	22	316L SST 传感器隔离膜片 sensor isolation diapragm、 316 SST 流程法兰、泄放阀、选用接头 process flange、release valve、selected joint 氟碳橡胶 接液 "O" 形密封圈 fluorinecarbon rubber o-shaped sealing ring			选用	
	23	哈氏合金 C-276 传感器隔离膜片 sensor isolation diapragm、 316 SST 流程法兰、泄放阀、选用接头 process flange、release valve、selected joint 氟碳橡胶 接液 "O" 形密封圈 fluorinecarbon rubber o-shaped sealing ring				
	25	钽材料 传感器隔离膜片 tantalum sensor isolation diapragm 316 SST 流程法兰、泄放阀、选用接头 process flange、release valve、selected joint 氟碳橡胶 接液 "O" 形密封圈 fluorinecarbon rubber o-shaped sealing ring				
流程法兰接头型式 Process flange joint type	O	1/4-18 NPT 内螺纹 female thread			选用	
	T	1/2-14 NPT 内螺纹 female thread				
	S1	带一个远传装置 (正压侧) with a remote device (positive pressure end				
	S2	带二个远传装置 with two remote devices				
显示器件型式 Display component type	M20	指针显示, 0~100%线性刻度 (输出 4~20mA 的变送器可选) indicator display, 0~100% linear scale(transmitter output 4~20mA is optional)			选用	
	M7	LCD(液晶) 显示, 可设置循环或固定显示压力、温度、电流、百分比与测量工程量单位等多种模式。 LCD display, have many modes like cyclic or regularly display pressure,temperature, current,percentage and measuring engineering unit etc;				
	M28	LED 显示, 中文显示界面 (回路增加压降 ≤6.5V) 同时显示压力、温度、电流、百分比与测量工程量单位。 LED display, Chinese display interface,(loop increase and reduce pressure is ≤6.5V),display pressure,temperature, current,percentage and measuring engineering unit at the same time				
	M30	LED 数字显不百分比量程 (4~20mA 回路增加压降 ≤3V) LED digital display percentage range(4~20mA loop pressure increase and reduce is ≤3V)				
	M32	LED 数字显示, 可按需设定 (4~20mA 回路增加压降 ≤3V) LED digital display, set according to requirements(4~20mA loop pressure increase and reduce is ≤3V)				
安装支架型式 installation support type	B1	弯支架管装 2" 管 tube curved support			选用	
	B2	弯支架板装 plate curved support				
	B3	平支架管装 2" 管 tube flat support				
防爆型式 Explosion-proof type	d	ExdIICT6 (隔爆型) explosion-proof type			选用	
	i	ExiallCT6(本安型)intrinsic safety type				
抗电源干扰型式 (本安防爆型不能用) anti power supply interference type (intrinsic safety explosion-proof type is not available)		k	安装内置式电源隔离模块 With built-in type power supply isolation module		选用	
引压接头 Pressure inlet joint		C12	一端为 1/2-14NPT 螺纹, 另一端为外径 14mm, 内径 6mm 连接管, 用于与其它管道焊接, 两端为可拆卸式螺纹连接。 One end is 1/2-14NPT thread, the other end is 14mm-outer diameter, 6mm-inner diameter connection tube, which is used to weld with pipe, both sides are detachable thread connection			选用

传感器隔离膜片、流程法兰、泄放阀、选用接头需其他材料请注明。Please note when select sensor isolated diaphragm, process flange, release valve and joint of other materials.

压力仪表系列 Pressure Instruments Series



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P-017

GP 型表压力变送器 GP type gauge pressure transmitter

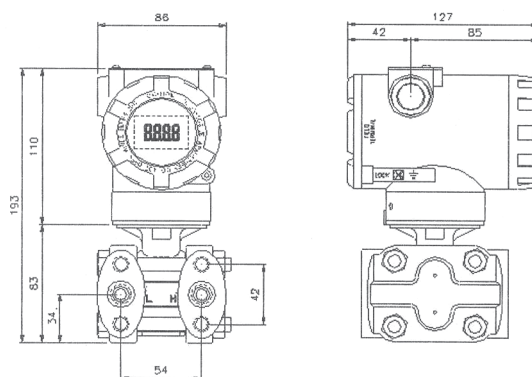
3151 系列
3151 series

3151 系列 GP 型表压力变送器

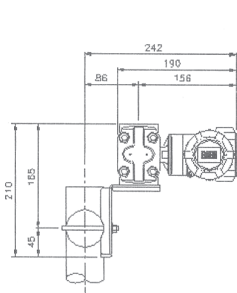
3151 series
GP type gauge pressure transmitter



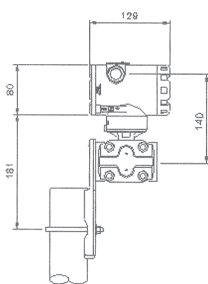
外形尺寸 overall dimension



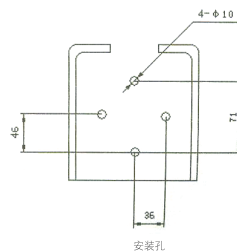
变送器使用的安装支架 mounting bracket for transmitter



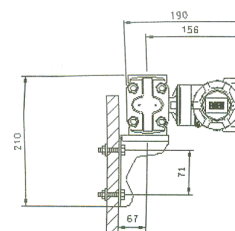
B1 型托架
B1 type bracket



B3 型托架
B3 type bracket



B2 型托架 B2 type bracket



GP 型表压力变送器
GP type gauge pressure transmitter



3151 系列
3151 series

P-018

选型编码表 model selectiona code table

3151 系列代码 3151 series code	变送器选型代码 transmitter model selection code				选用项 options
测量类型	GP	表压力变送器 gauge pressure transmitter			
可调试的量程范 (kPa) Adjustable measuring range	3	0-0.15~7.5	注，使用 1kpa 以下量程须在订货合同中注明。 Mark out when range is below 1KPa		
	4	0-0.4~40			
	5	0-2~200			
	6	0-7~700			
	7	0-21~2100			
	8	0-70~7000			
	9	0-210~21000			
	0	0-420~42000			
推荐使用量程 (kPa) Recommended range	3	0-1~7.5			
	4	0-4~40			
	5	0-20~200			
	6	0-70~700			
	7	0-210~2100			
	8	0-700~7000			
	9	0-2100~21000			
	0	0-4200~42000			
输出信号型式 Outpur signal type	A	4~20mA 直流信号 +HART 协议数字信号 (单参数) DC signal+HART protocol digital signal(single parameter)			选用
	B	4~20mA 直流信号 +HART 协议数字信号 (多参数) DC signal+HART protocol digital signal(multi parameter)			
	E	工业以太网协议的数字量信号 industrial Ethernet protocol digital signal			
	F	FF 基金会现场总线协议的数字量信号 FF bus protocol digital signal			
	P	Profibus-PA 协议的数字量信号 digital signal of bus-PA protocol			
与测量介质接触的部件材料 material of medium wetted parts	22	316L SST 传感器隔离膜片 sensor isolation diaphragm、 316 SST 流程法兰、泄放阀、选用接头 process flange、release valve、selected joint 氟碳橡胶 接液 “O” 形密封圈 fluorinecarbon rubber o-shaped sealing ring			选用
	23	哈氏合金 C-276 传感器隔离膜片 sensor isolation diaphragm、 316 SST 流程法兰、泄放阀、选用接头 process flange、release valve、selected joint 氟碳橡胶 接液 “O” 形密封圈 fluorinecarbon rubber o-shaped sealing ring			
	25	钽材料 传感器隔离膜片 tantalum sensor isolation diaphragm 316 SST 流程法兰、泄放阀、选用接头 process flange、release valve、selected joint 氟碳橡胶 接液 “O” 形密封圈 fluorinecarbon rubber o-shaped sealing ring			
流程法兰接头型式 Process flange joint type	O	1/4-18 NPT 内螺纹 female thread			选用
	T	1/2-14 NPT 内螺纹 female thread			
	S1	带一个远传装置 (正压侧) with a remote device (positive pressure end			
显示器件型式 Display component type	M20	指针显示，0~100%线性刻度 (输出 4~20mA 的变送器可选) indicator display, 0~100% linear scale(transmitter output 4~20mA is optional)			选用
	M7	LCD(液晶) 显示，可设置循环或固定显示压力、温度、电流、百分比与测量工程量单位等多种模式。 LCD display, have many modes like cyclic or regularly display pressure,temperature, current,percentage and measuring engineering unit etc;			
	M28	OLED 显示，中文显示界面 (回路增加压降 ≤6.5V) 同时显示压力、温度、电流、百分比与测量工程量单位。 LED display, Chinese display interface,(loop increase and reduce pressure is ≤6.5V),display pressure,temperature, current,percentage and measuring engineering unit at the same time			
	M30	LED 数字显不百分比量程 (4~20mA 回路增加压降 ≤3V) LED digital display percentage range(4~20mA loop pressure increase and reduce is ≤3V)			
	M32	LED 数字显示，可按需设定 (4~20nA 回路增加压降 ≤3V) LED digital display, set according to requirements(4~20mA loop pressure increase and reduce is ≤3V)			
安装支架型式 installation support type	B1	弯支架管装 2" 管 tube curved support			选用
	B2	弯支架板装 plate curved support			
	B3	平支架管装 2" 管 tube flat support			
防爆型式 Explosion-proof type	d	ExdIICT6 (隔爆型) explosion-proof type			选用
	i	ExiallCT6(本安型)intrinsic safety type			
抗电源干扰型式 (本安防爆型不能用) anti power supply interference type (intrinsic safety explosion-proof type is not available)	k	安装内置式电源隔离模块 With built-in type power supply isolation module			选用
引压接头 Pressure inlet joint	C12	一端为 1/2-14NPT 螺纹，另一端为外径 14mm，内径 6mm 连接管，用于与其它管道焊接， 两端为可拆卸式螺纹连接。 One end is 1/2-14NPT thread, the other end is 14mm-outer diameter, 6mm-inner diameter connection tube, which is used to weld with pipe, both sides are detachable thread connection			选用

传感器隔离膜片、流程法兰、泄放阀、选用接头需其他材料请注明。Please note when select sensor isolated diaphragm, process flange, release valve and joint of other materials.



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P-019

智能型压力变送器

Smart pressure transmitter

3151TG 系列
3151TG series

3151TG

智能型压力变送器

3151TG
Smart pressure transmitter



- 隔离硅压阻传感器
 - 超低温漂移影响
 - 可满足各种恶劣工业环境
 - 典型运用：工业流程控制
- isolated silicon piezoresistive sensor
 - ultra low temperature drift influence
 - suitable to various hostile industrial environment
 - typical application: industrial process control

主要技术参数 main technical parameter				
量程范围 range	正表压 positive gauge pressure		负表压 negative gauge pressure	
	最小范围 min	最大范围 max	最小范围 min	最大范围 max
	5kPa	60MPa	-5kPa	-100kPa
精度等级 accuracy class	0.2%F.S., 0.5%F.S.			
工作电压 working pressure	13~45VDC, 24VDC			
输出信号 output signal	4~20mA, 1~5VDC, HART 可约定			
温度范围 temperature range	补偿温度 temperature	介质温度 medium	储存温度 storage	
	0~50℃，-10~80℃，可约定	-40~85℃	-40~85℃	
温度影响 temperature influence	0.02%F.S./℃			
电气连接 electrical connection	接线端子 wiring terminal			
防护等级 protection class	IP65			
螺纹接口 thread interface	M20*1.5 外螺纹, 可约定 male thread			
外壳材质 enclosure material	低铜铝合金 low copper aluminum alloy			

AP 型绝对压力变送器

AP type absolute pressure transmitter



3151 系列
3151 series

P-020

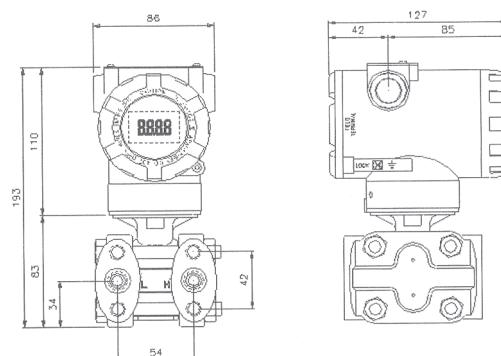
3151 系列

AP 型绝对压力变送器

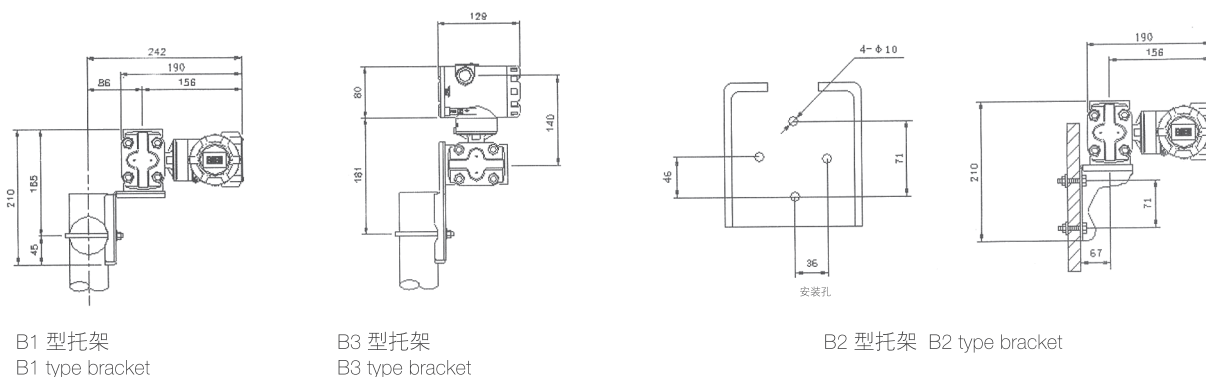
3151 series
AP type absolute pressure transmitter



外形尺寸 overall dimension



变送器使用的安装支架 mounting bracket for transmitter



B1 型托架
B1 type bracket

B3 型托架
B3 type bracket

B2 型托架 B2 type bracket

压力仪表系列 Pressure Instruments Series



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P-021

AP 型绝对压力变送器

AP type absolute pressure transmitter

3151 系列
3151 series

选型编码表 model selection code table

3151 系列代码 3151 series code	变送器选型代码 transmitter model selection code		选用项 options
测量类型	AP	绝对压力变送器 absolute pressure transmitter	
可调式的量程范 (kPa) Adjustable measuring range	4	0-4~40	
	5	0-2~200	
	6	0-7~700	
	7	0-21~2100	
推荐使用量程 (kPa) Recommended range	4	0-4~40	
	5	0-20~200	
	6	0-70~700	
	7	0-210~2100	
输出信号型式 Output signal type	A	4~20mA 直流信号 +HART 协议数字信号 (单参数) DC signal+HART protocol digital signal(single parameter)	选用
	B	4~20mA 直流信号 +HART 协议数字信号 (多参数) DC signal+HART protocol digital signal(multi parameter)	
	E	工业以太网协议的数字量信号 industrial Ethernet protocol digital signal	
	F	FF 基金会现场总线协议的数字量信号 FF bus protocol digital signal	
	P	Profibus-PA 协议的数字量信号 digital signal of bus-PA protocol	
与测量介质接触的部件材料 material of medium wetted parts	22	316L SST 传感器隔离膜片 sensor isolation diaphragm、 氟碳橡胶 接液 "O" 形密封圈 fluorinecarbon rubber o-shaped sealing ring	选用
	23	哈氏合金 C-276 传感器隔离膜片 sensor isolation diaphragm、 316 SST 流程法兰、泄放阀、选用接头 process flange、release valve、selected joint 氟碳橡胶 接液 "O" 形密封圈 fluorinecarbon rubber o-shaped sealing ring	
	25	钽材料 传感器隔离膜片 tantalum sensor isolation diaphragm 316 SST 流程法兰、泄放阀、选用接头 process flange、release valve、selected joint 氟碳橡胶 接液 "O" 形密封圈 fluorinecarbon rubber o-shaped sealing ring	
流程法兰接头型式 Process flange joint type	O	1/4-18 NPT 内螺纹 female thread	选用
	T	1/2-14 NPT 内螺纹 female thread	
	S _r	带一个远传装置 (正压侧) with a remote device (positive pressure end	
显示器件型式 Display component type	M20	指针显示, 0~100%线性刻度 (输出 4~20mA 的变送器可选) indicator display, 0~100% linear scale(transmitter output 4~20mA is optional)	选用
	M7	LCD(液晶) 显示, 可设置循环或固定显示压力、温度、电流、百分比与测量工程量单位等多种模式。 LCD display, have many modes like cyclic or regularly display pressure,temperature, current,percentage and measuring engineering unit etc;	
	M28	LED 显示, 中文显示界面 (回路增加压降 ≤6.5V) 同时显示压力、温度、电流、百分比与测量工程量单位。 LED display, Chinese display interface,(loop increase and reduce pressure is ≤6.5V),display pressure,temperature, current,percentage and measuring engineering unit at the same time	
	M30	LED 数字显不百分比量程 (4~20mA 回路增加压降 ≤3V) LED digital display percentage range(4~20mA loop pressure increase and reduce is ≤3V)	
	M32	LED 数字显示, 可按需设定 (4~20mA 回路增加压降 ≤3V) LED digital display, set according to requirements(4~20mA loop pressure increase and reduce is ≤3V)	
安装支架型式 installation support type	B1	弯支架管装 2" 管 tube curved support	选用
	B2	弯支架板装 plate curved support	
	B3	平支架管装 2" 管 tube flat support	
防爆型式 Explosion-proof type	d	ExdIICT6 (隔爆型) explosion-proof type	选用
	i	ExialICT6(本安型) intrinsic safety type	
抗电源干扰型式 (本安防爆型不能用) anti power supply interference type (intrinsic safety explosion-proof type is not available)	k	安装内置式电源隔离模块 With built-in type power supply isolation module	选用
引压接头 Pressure inlet joint	C12	一端为 1/2-14NPT 螺纹, 另一端为外径 14mm, 内径 6mm 连接管, 用于与其它管道焊接, 两端为可拆卸式螺纹连接。 One end is 1/2-14NPT thread, the other end is 14mm-outer diameter, 6mm-inner diameter connection tube, which is used to weld with pipe, both sides are detachable thread connection	选用

传感器隔离膜片、流程法兰、泄放阀、选用接头需其他材料请注明。Please note when select sensor isolated diaphragm, process flange, release valve and joint of other materials.

HP 型高静压差压变送器

HP type high static differential pressure transmitter



3151 系列
3151 series

P-022

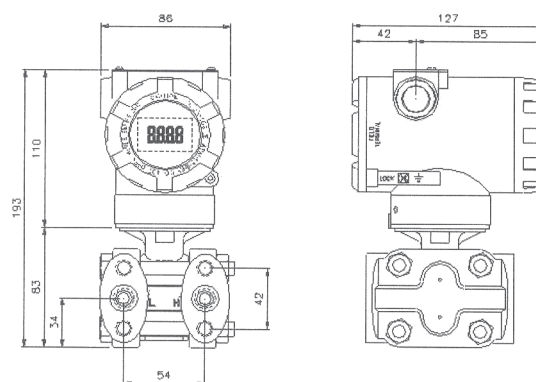
3151 系列

HP 型高静压差压变送器

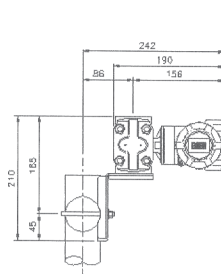
3151 series
HP type high static differential pressure transmitter



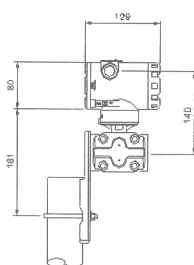
外形尺寸 Overall dimension



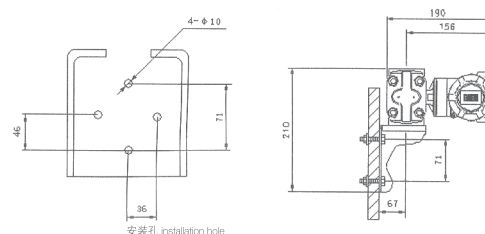
变送器使用的安装支架 Mounting bracket for transmitter



B1 型托架
B1 type bracket



B3 型托架
B3 type bracket



B2 型托架 B2 type bracket



压力仪表系列 Pressure Instruments Series

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P-023

HP 型高静压差压变送器

HP type high static differential pressure transmitter

3151 系列

3151 series

选型编码表 model selection code table

3151 系列代码 3151 series code	变送器选型代码 transmitter model selection code		选用项 options
测量类型 Measurement type	HP	高静压差压变送器 high static differential pressure transmitter	
可调试的量程范 (kPa) Adjustable measuring range	4	0-0.4~40 注: 使用 1kpa 以下量程须在订货合同中注明。Mark out when range is below 1KPa	
	5	0-2~200	
	6	0-7~700	
	7	0-21~2100	
推荐使用量程 (kPa) Recommended range	4	0-4~40	
	5	0-20~200	
	6	0-70~700	
	7	0-210~2100	
输出信号型式 Output signal type	A	4~20mA 直流信号 +HART 协议数字信号 (单参数) DC signal+HART protocol digital signal(single parameter)	选用
	B	4~20mA 直流信号 +HART 协议数字信号 (多参数) DC signal+HART protocol digital signal(multi parameter)	
	E	工业以太网协议的数字量信号 industrial Ethernet protocol digital signal	
	F	基金会现场总线协议的数字量信号 FF bus protocol digital signal	
	P	Profibus-PA 协议的数字量信号 digital signal of bus-PA protocol	
与测量介质接触的部件材料 material of medium wetted parts	22	316L SST 传感器隔离膜片 sensor isolation diaphragm、 316 SST 流程法兰、泄放阀、选用接头 process flange、release valve、selected joint 氟碳橡胶 接液 "O" 形密封圈 fluorinecarbon rubber o-shaped sealing ring	选用
	23	哈氏合金 C-276 传感器隔离膜片 sensor isolation diaphragm、 316 SST 流程法兰、泄放阀、选用接头 process flange、release valve、selected joint 氟碳橡胶 接液 "O" 形密封圈 fluorinecarbon rubber o-shaped sealing ring	
	25	钽材料 传感器隔离膜片 tantalum sensor isolation diaphragm 316 SST 流程法兰、泄放阀、选用接头 process flange、release valve、selected joint 氟碳橡胶 接液 "O" 形密封圈 fluorinecarbon rubber o-shaped sealing ring	
流程法兰接头型式 Process flange joint type	O	1/4-18 NPT 内螺纹 female thread	选用
	T	1/2-14 NPT 内螺纹 female thread	
	S1	带一个远传装置 (正压侧) with a remote device (positive pressure end	
	S2	带二个远传装置 with two remote devices	
显示器件型式 Display component type	M20	指针显示, 0~100%线性刻度 (输出 4~20mA 的变送器可选) indicator display, 0~100% linear scale(transmitter output 4~20mA is optional)	选用
	M7	LCD(液晶) 显示, 可设置循环或固定显示压力、温度、电流、百分比与测量工程量单位等多种模式。 LCD display, have many modes like cyclic or regularly display pressure,temperature, current,percentage and measuring engineering unit etc;	
	M28	OLED 显示, 中文显示界面 (回路增加压降 ≤6.5V) 同时显示压力、温度、电流、百分比与测量工程量单位。 LED display, Chinese display interface,(loop increase and reduce pressure is ≤6.5V),display pressure,temperature, current,percentage and measuring engineering unit at the same time	
	M30	LED 数字显示不百分比量程 (4~20mA 回路增加压降 ≤3V) LED digital display percentage range(4~20mA loop pressure increase and reduce is ≤3V)	
	M32	LED 数字显示, 可按需设定 (4~20mA 回路增加压降 ≤3V) LED digital display, set according to requirements(4~20mA loop pressure increase and reduce is ≤3V)	
安装支架型式 installation support type	B1	弯支架管装 2" 管 tube curved support	选用
	B2	弯支架板装 plate curved support	
	B3	平支架管装 2" 管 tube flat support	
防爆型式 Explosion-proof type	d	ExdIICT6 (隔爆型) explosion-proof type	选用
	i	ExiaIICT6(本安型) intrinsic safety type	
抗电源干扰型式 (本安防爆型不能用) anti power supply interference type (intrinsic safety explosion-proof type is not available)	k	安装内置式电源隔离模块 With built-in type power supply isolation module	选用
引压接头 Pressure inlet joint	C12	一端为 1/2-14NPT 螺纹, 另一端为外径 14mm, 内径 6mm 连接管, 用于与其它管道焊接, 两端为可拆卸式螺纹连接。 One end is 1/2-14NPT thread, the other end is 14mm-outer diameter, 6mm-inner diameter connection tube, which is used to weld with pipe, both sides are detachable thread connection	选用

传感器隔离膜片、流程法兰、泄放阀、选用接头需其他材料请注明。Please note when select sensor isolated diaphragm, process flange, release valve and joint of other materials.

DP/GP 型差压 / 压力变送器
DP/GP type differential pressure / pressure transmitter

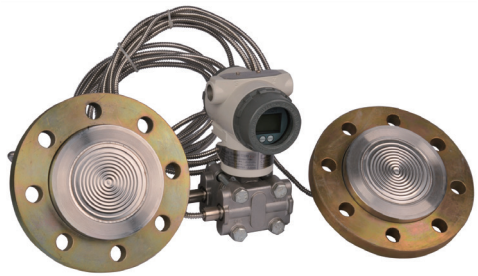


3151 系列
3151 series

P-024

带 1199 远传法兰的 3151 系列
DP/GP 型差压 / 压力变送器

3151 series with 1199 remote transmission flange
DP/GP type differential pressure/pressure transmitter



3151DP / GP 型变送器带上 1199 型远传密封装置法兰 (其种类见表 1~10 后, 就成为 3151DP / GP 型远传压力变送器。

这种 3151DP / GP 远传差压、压力变送器给用户提供了一种避免被介质直接与变送器的隔膜片接触的测量方法。它适用于下面几种情况:

1. 被测介质对变送器接头和压力传感器有腐蚀作用时
2. 需要将高温被测介质与变送器隔离时
3. 被测介质中有固体悬浮或高粘度易堵塞变送器的接头时
4. 被测介质因环境温度或程度变化出现固化或结晶时
5. 要换被测介质需要冲洗而不会交混时
6. 必须保持卫生条件 (防污染) 时 3151 DP / GP 带上 1199 的远传压力变送器, 仍具有 3151DP / GP 型差压、压力变送器的各种特点。

注意:

下面给出的各种带有 1199 型远传装置类型的变送器, 供用户选型、订货时查阅, 此外, 还应从表中选择所需的毛细管、填充液一起配合使用。

3151 series DP/GP type transmitter with 1199 type remote transmission sealing device flange (specifications is in chart) is 3151DP/GP type remote transmission pressure transmitter.

standard 3151GP pressure transmitter with remote transmission device parts avoid contacts between measured medium and transmitter isolated diaphragm and are applicable to the following conditions:

1. When measured medium is corrosive;
2. When there is need to separate high temperature measured medium from transmitter;
3. When there is solid float or high-viscosity joint in the measured medium;
4. When measured medium is solidified or crystallized because of environmental temperature or process variation;
5. When there is need to change and wash the measured medium without mixing ;
6. When you have to guarantee the sanitary condition (without pollution). 3151 DP/GP with 1199 remote transmission pressure tranmission still has features of 3151DP/GP pressure transmitter.

Note:

The following various transmitters with 1199 type remote transmission devices are for users to select and order, besides, users should select corresponding capillary and filling liquid from table to work with the transmitters.





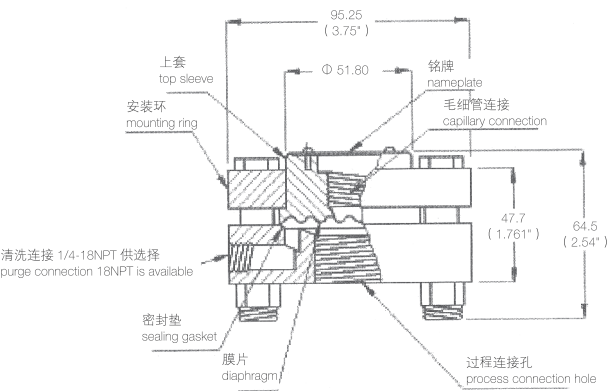
DP/GP 型差压 / 压力变送器
DP/GP type differential pressure / pressure transmitter

3151 系列
3151 series

带 1199RTW 型螺纹安装远传法兰的 3151 差压、压力变送器
3151 type differential pressure, pressure transmitter with 1199RTW type thread installation remote flange

表 1 螺纹安装远传法兰订货规格表
Table 1 specifications of thread mounting remote transmission flange

1199RTW 型	螺纹安装远传法兰 Thread mounted remote flange					
	代号 Code	测量范围 Measuring range				
	11	无 With				
	21	有 Without				
		代号 Code	远传装置膜片材料 Remote device diaphragm mater			
		A	316 LSS			
		B	哈氏合金 C-276 Hastelloy alloy			
		C	钽 Tantalum			
			代号 code	结构件材料 Material of structure parts		
			11	上套为 316SS，安装环为碳钢，垫圈为白色石棉 Top sleeve316SS，mounting ring is carbon steel, gasket is white asbestos		
				代号 code	下套材料 Material of below sleeve	
				A	316SS	
				B	哈氏合金 C Hastelloy alloy	
				C	碳钢(电镀) Carbon steel(electroplate)	
					代号 Code	下套材料 Material of below sleeve
					11	1/4"NPT(锥管螺纹 Taper pipe thread)
					12	3/8"NPT(锥管螺纹 Taper pipe thread)
					13	1/2"NPT(锥管螺纹 Taper pipe thread)
					15	1"NPT(锥管螺纹 Taper pipe thread)
					17	1-1/2"NPT(锥管螺纹 Taper pipe thread)(不带清洗备用孔 Wintout spare washing hole)
1199RTW	11	A	11	A	17	← 变送器完整型号 Transmitter complete model



DP/GP 型差压 / 压力变送器
DP/GP type differential pressure / pressure transmitter



3151 系列
3151 series
P-026

带 1199RTW 型法兰安装远传法兰的 3151 差压 / 压力变送器
3151 differential pressure/ pressure transmitter with 1199RTW type flange installation remote flange

表 2 1199RFW 型法兰安装远传法兰
Table 2 1199RFW type flange mounted remote transmission flange

1199RFW 型	法兰安装远传法兰 Flange mounted remote flange			
	代号 cod	冲洗备用机 Spare washing device		
	11	无 Sith		
	12	有 Sithout		
	代号	远传装置膜片材料 Material of remote device diaphragm		
	A	316L SST		
	B	哈氏合金 C Hastelloy alloy		
	C	钽 Tantalum		
	代号	结构件材料 Material of structure parts		
	11	上套为 316L SST, 法兰为碳钢镀镉, 垫圈为白色石棉。 Top sleeve is 316L SST, flange is carbon steel cadmium plating, gasket is white asbestos		
	代号 Code	下套尺寸和材料 Size and material of below sleeve		
	A21	1"	150#	316SST
	B21	1"	150#	哈氏合金 C Hastelloy alloy
	E21	1"	150#	碳钢 Carbon steel
	A41	1-1/2"	150#	316SST
	B41	1-1/2"	150#	哈氏合金 C Hastelloy alloy
	E41	1-1/2"	150#	碳钢 Carbon steel
	A51	2"	150#	316SST
	B51	2"	150#	哈氏合金 C Hastelloy alloy
	E51	2"	150#	碳钢 Carbon steel
	A71	3"	150#	316SST
	B71	3"	150#	哈氏合金 C Hastelloy alloy
	E71	3"	150#	碳钢 Carbon steel
	A22	1"	300#	316SST
	B22	1"	300#	哈氏合金 C Hastelloy alloy
	E22	1"	300#	碳钢 Carbon steel
	A42	1-1/2"	300#	316SST
	B42	1-1/2"	300#	哈氏合金 C Hastelloy alloy
	E42	1-1/2"	300#	碳钢 Carbon steel
	A52	2"	300#	316SST
	B52	2"	300#	哈氏合金 C Hastelloy alloy
	E52	2"	300#	碳钢 Carbon steel
	A72	3"	300#	316SST
	B72	3"	300#	哈氏合金 C Hastelloy alloy
	E72	3"	300#	碳钢 Carbon steel
	A24	1"	600#	316SST
	B24	1"	600#	哈氏合金 C Hastelloy alloy
	E24	1"	600#	碳钢 Carbon steel
	A44	1-1/2"	600#	316SST
	B44	1-1/2"	600#	哈氏合金 C Hastelloy alloy
	E44	1-1/2"	600#	碳钢 Carbon steel
	A54	2"	600#	316SST
	B54	2"	600#	哈氏合金 C Hastelloy alloy
	E54	2"	600#	碳钢 Carbon steel
	A74	3"	600#	316SST
	B74	3"	600#	哈氏合金 C Hastelloy alloy
	E74	3"	600#	碳钢 Carbon steel
1199RFW	11	A	11	A71
← 典型型号				

注: 在温度为 38℃时, 150# 工作压力为 1.97MPa, 300# 工作压力为 5.1MPa, 600# 工作压力为 9.9MPa
Notes: when temperature is 38℃, working pressure of 150# is 1.97MPa, working pressure of 300# is 5.1MPa, working pressure of 600# is 9.9MPa.

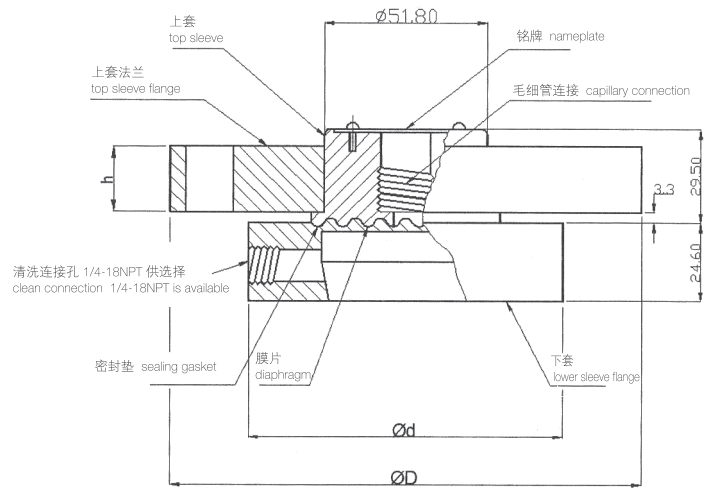


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P-027

DP/GP 型差压 / 压力变送器
DP/GP type differential pressure / pressure transmitter

3151 系列
3151 series



管道名义尺寸 Nominal size of pipe	额定压力等级 Rated pressure	D (mm)	h (mm)	d (mm)	螺栓孔 Bolt hole		
					分布直径 (mm) Distribution diameter	数量	孔径 (mm)
1"	150#	Φ 108	14.3(9/16")	Φ 66.5	Φ 79.4	4	Φ 15.7
	300#	Φ 124	17.5(11/16")	Φ 66.5	Φ 88.9	4	Φ 19.1
	600#	Φ 124	17.5(11/16")	Φ 66.5	Φ 88.9	4	Φ 19.1
1 1/2"	150#	Φ 127	17.5(11/16")	Φ 78.7	Φ 98.4	4	Φ 15.7
	300#	Φ 156	20.6(13/16") 22.2(7/8")	Φ 78.7	Φ 114.3	4	Φ 22.4
	600#	Φ 156	20.6(13/16") 22.2(7/8")	Φ 78.7	Φ 114.3	4	Φ 22.4
2"	150#	Φ 152	19.1(3/4")	Φ 95.25	Φ 120.7	4	Φ 19.1
	300#	Φ 165	22.2(7/8") 25.4(1")	Φ 95.25	Φ 127	4	Φ 19.1
	600#	Φ 165	22.2(7/8") 25.4(1")	Φ 95.25	Φ 127	4	Φ 19.1
3"	150#	Φ 190	23.8(15/16")	Φ 127	Φ 152.4	4	Φ 19.1
	300#	Φ 210	28.6(1 1/8")	Φ 127	Φ 168.3	4	Φ 22.4
	600#	Φ 210	31.8(1 1/4")	Φ 127	Φ 168.3	4	Φ 22.4

注：在温度为 38℃ 时，150# 工作压力为 1.97MPa，300# 工作压力为 5.1MPa，600# 工作压力为 9.9MPa。

Notes: when temperature is 38℃, working pressure of 150# is 1.97MPa, working pressure of 300# is 5.1MPa, working pressure of 600# is 9.9MPa.

DP/GP 型差压 / 压力变送器
DP/GP type differential pressure / pressure transmitter



3151 系列
3151 series

P-028

带 1199RTW 型扁平式远传法兰的 3151 差压 / 压力变送器

3151 differential pressure / pressure transmitter with 1199RTW flat type remote flange

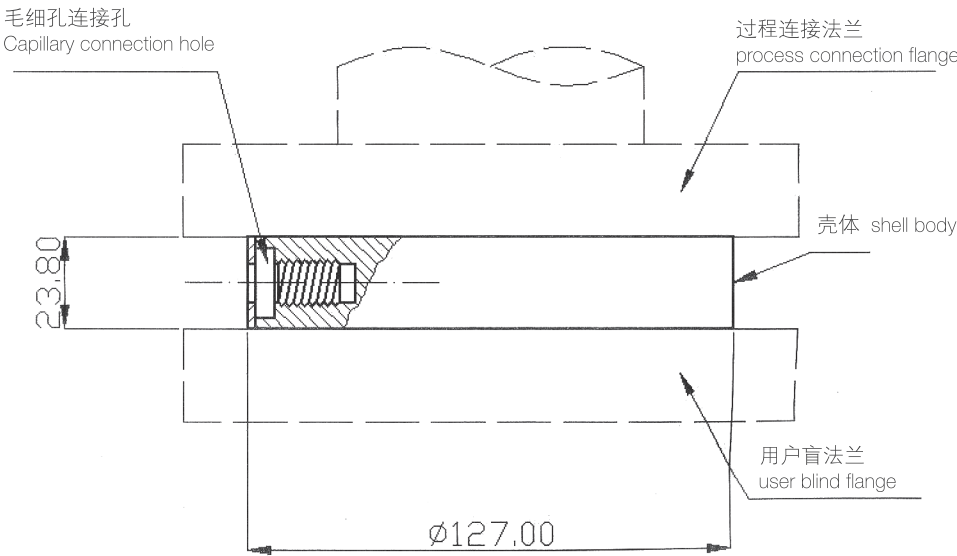
表 3 扁平式远传法兰订货型号规格表

Table 3 specifications of flat type remote transmission flange

1199PFW 型		扁平式远传法兰 Flat type remote flange		
	代号	型式 Type		
	11	标准 3", 最大工作压力, 按 ANSI 法兰耐压等级规定 Standard 3#, max working pressure is in compliance with ANSI flange pressure class		
		代号	远传法兰膜片材料 Material of remote flange diaphragm	
		A	316 SST	
		B	哈氏合金 C-276 Hastelloy alloy	
		C	钽 Tantalum	
		代号	远传法兰 Remote flange	
		11	316 SST	
1199PFW	11	A	11	← 典型型号 Typical model

适用于 150#、300# 和 600# 等级的法兰

Applicable to flanges of grade 150# ,grade 300# and grade 600# .



压力仪表系列 Pressure Instruments Series



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P-029

DP/GP 型差压 / 压力变送器

DP/GP type differential pressure / pressure transmitter

3151 系列

3151 series

带 1199RTW 型插入式远传法兰的 3151 差压 / 压力
变送器

3151 differential pressure / pressure transmitter with 1199RTW
type plug remote flange

表 4 插入式远传法兰订货型号规格表

Table 4 specification of plug-in type remote flange

1199 EFW 型		插入式远传法兰 Plug-in type remote flange			
	代号 code	插入筒直径和接液部材料 Diameter of insert cylinder and material of wetted parts			
	11	3" 316 不锈钢 Stainless steel			
	12	3" 哈氏合金 C 包覆的不锈钢 Stainless stell coated by Hastelloy alloy C			
	13	4" 316 不锈钢 Stainless steel			
	14	4" 哈氏合金 C 包覆的不锈钢 Stainless stell coated by Hastelloy alloy C			
	代号	膜片材料 Material of diaphragm			
	A	316 不锈钢 Stainless steel			
	B	哈氏合金 C Hastelloy alloy			
	C	钽 Tantalum			
	代号	插入筒长度 Length of insert cylinder			
	20	50.8 mm			
	40	101.6 mm			
	60	152.4 mm			
	代 号	法兰规格和材料 Specification and material of flange			
	A11	150" 有镀层碳钢，最大工作压力 = 1.97MPa 150" wht coated carbon steel, max working pressure is 1.97MPa			} 在 38℃时
	A12	300" 有镀层碳钢，最大工作压力 =5.1MPa 300" wht coated carbon steel, max working pressure is 5.1MPa			
	A13	600" 有镀层碳钢，最大工作压力 =9.9MPa 600" wht coated carbon steel, max working pressure is 9.9MPa			
1199EFW	11	A	20	A11	← 典型型号 Typical model

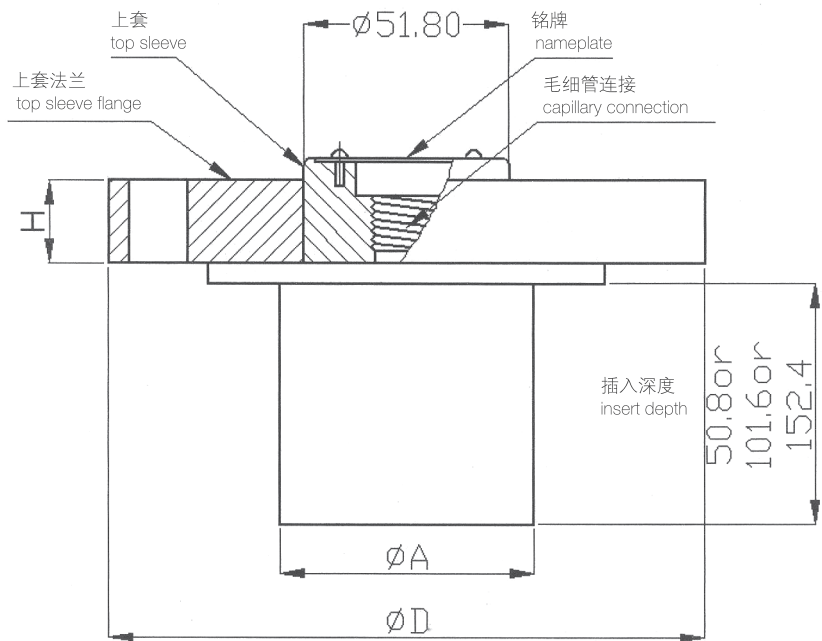
对 4" 插入筒无 600° 规格 There is no 600° type for 4" insert tube

DP/GP 型差压 / 压力变送器
DP/GP type differential pressure / pressure transmitter



3151 系列
3151 series

P-030



管道名义尺寸 Nominal size of pipe	额定工作 压力 Rated working pressure	上支座法兰的参数 parameter of upper bearing flange					插入孔直径 A(mm) Insert hole diameter
		外径 D(mm) Outer diameter	厚度 H(mm) Thickness	螺孔直径 d(mm) Screw hole diameter	数量	螺孔分布直 Screw hole distribution diameter(mm)	
76.2 (3")	150#	Φ 190($7\frac{1}{2}$ ")	23.8($\frac{15}{16}$ ")	Φ 19.1(0.75")	4	Φ 152.4(6")	Φ 66
	300#	Φ 210($8\frac{1}{4}$ ")	28.6($1\frac{1}{8}$ ")	Φ 22.4(0.88")	8	Φ 168.3($6\frac{5}{8}$ ")	
	600#	Φ 210($8\frac{1}{4}$ ")	31.8($1\frac{1}{4}$ ")	Φ 22.4(0.88")	8	Φ 168.3($6\frac{5}{8}$ ")	
101.6 (4")	150#	Φ 228.6(9")	23.8(15/16")	Φ 19.1(0.75")	8	Φ 190($7\frac{1}{2}$ ")	Φ 89
	300#	Φ 254(10")	31.8($1\frac{1}{4}$ ")	Φ 22.4(0.88")	8	Φ 200($7\frac{7}{8}$ ")	
	600#	Φ 273($10\frac{3}{4}$ ")	38.1($1\frac{1}{2}$ ")	Φ 25.4(1.0")	8	Φ 215.9($8\frac{1}{2}$ ")	

注：在温度 38℃ 时，150# 工作压力为 1.97MPa，300# 工作压力为 5.1MPa，600# 工作压力为 9.9MPa。
Notes: when temperature is 38℃，working pressure of 150# is 1.97MPa,working pressure of 300# is 5.1MPa, working pressure of 600# is 9.9MPa.

压力仪表系列 Pressure Instruments Series



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P-031

DP/GP 型差压 / 压力变送器

DP/GP type differential pressure / pressure transmitter

3151 系列
3151 series

带 1199SCW 型防污染式远传法兰的 3151 差压 / 压力变送器

3151 differential pressure / pressure transmitter with 1199SCW pollution-proof type remote flange

表 5 防污染式远传法兰订货型号规格表

Table 5 specification of anti-pollution type remote transmission flange

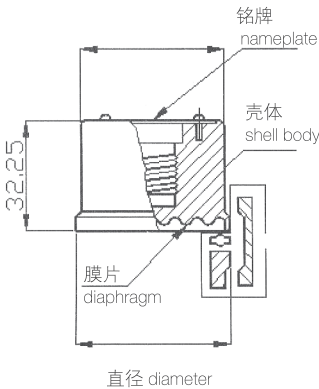
1199SCW 型	防污染式远传法兰 Anti-pollution type remote transmission flange	
	代号	远传法兰型号 Remote transmission flange model
	11	2# 卡箍 (Triclamp) 毛细管型 Capillary type
	12	3# 卡箍 (Triclamp) 毛细管型 Capillary type
	13	2# 卡箍 (Triclamp) 液位型 Liquid level type
	14	3# 卡箍 (Triclamp) 液位型 Liquid level type
	代号	远传法兰材料 Material of remote flange
	A	316SST
	代号	壳体材料 Shell material
	11	316SST
	1199SCW	12 A 11 ← 典型型号 Typical model

直径 diameter

11 型 =54.9(2.160")
Type 11= 54.9(2.160")
12 型 =81.8(3.22")
Type 12=81.8(3.22")

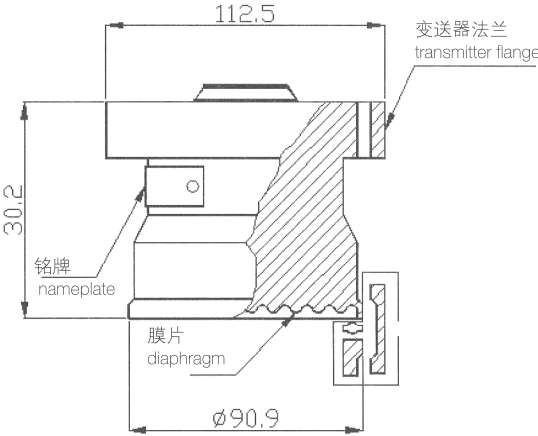
11 型 =2" 名义值
type 11=2" nominal value
12 型 =3" 名义值
type 12=3" nominal value

13、14 型
type 13、14



11 型 =63.9
Type 11=63.9
12 型 =90.9
type 12= 90.9

装上密封垫用卡箍和用户接头连起来
Install the sealing gasket and connect it with the subscriber connector with a clamp



装上密封垫用卡箍和用户接头连起来
Install the sealing gasket and connect it with the subscriber connector with a clamp

DP/GP 型差压 / 压力变送器
DP/GP type differential pressure / pressure transmitter



3151 系列
3151 series

P-032

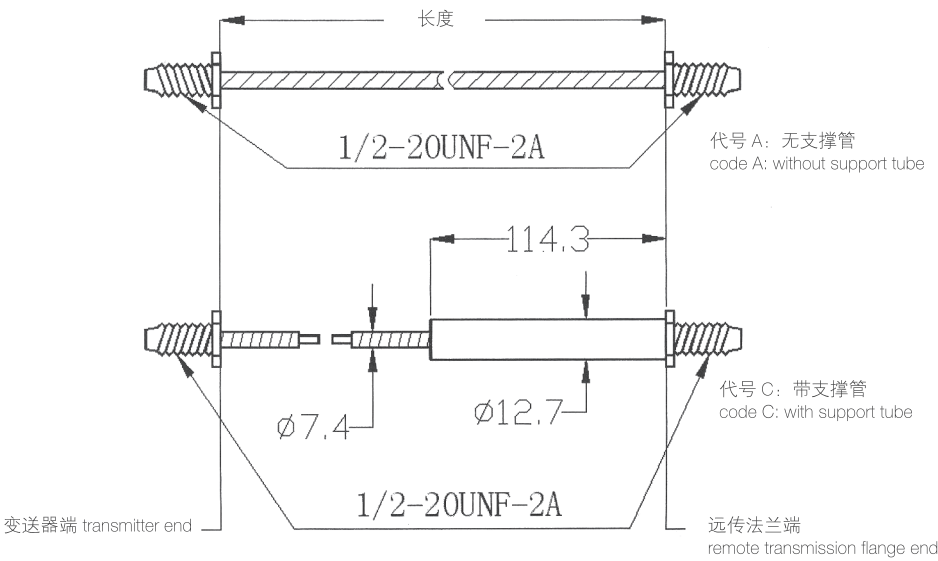
1199CAP 型毛细管

1199CAP type capillary trbe

表 6 毛细管订货型号规格表

Table 6 specifications of capillary

1199CAP 型		毛细管 Capillary					
	代号 Code	毛细管材料和尺寸 material and size of capillary					
	11	316SST 内径为 0.71mm,inner diameter of 316SST is 0.71mm					
	13	316SST 内径为 1.09mm,inner diameter os 316SST is 1.09mm					
	代号 code	变送器端配件 transmitter end fittings					
	D	低容积法兰, 316SST low volume flange,316SST					
	代号 code	毛细管长度 length of capillary					
	05	1.524 米	1.524meter				
	10	3.048 米	3.048meter				
	15	4.572 米	4.572meter				
	20	6.096 米	6.096meter				
	25	7.62 米	7.62meter				
	代号	远传端法兰配件 remote transmission end flange fittings					
	A	1/2-20uNF-2A 螺纹, 适用于 RFW、RTW、SCW、EFW					
	C	1/2-20uNF-2Athread, applicable for RFW,RTW,SCW, 1/2-20UNF-2A 螺纹, 适用于 PFW、CTW、UCW					
		1/2-20uNF-2Athread, applicable for PFW,CTW,UCW					
	代号 code	保护套管 protective case					
	11	铠装 300SST 系列不锈钢					
12	Armoured 300SST series stainless steel						
	PVC 护套, 铠装 300SST 系列不锈钢						
	PVC protective jacket, armoured 300SST series stainless steel						
1199CAP 型		11	A	15	A	11	← 典型型号 typical model





DP/GP 型差压 / 压力变送器
DP/GP type differential pressure / pressure transmitter

3151 系列
3151 series

1199 CLC 型近耦接头

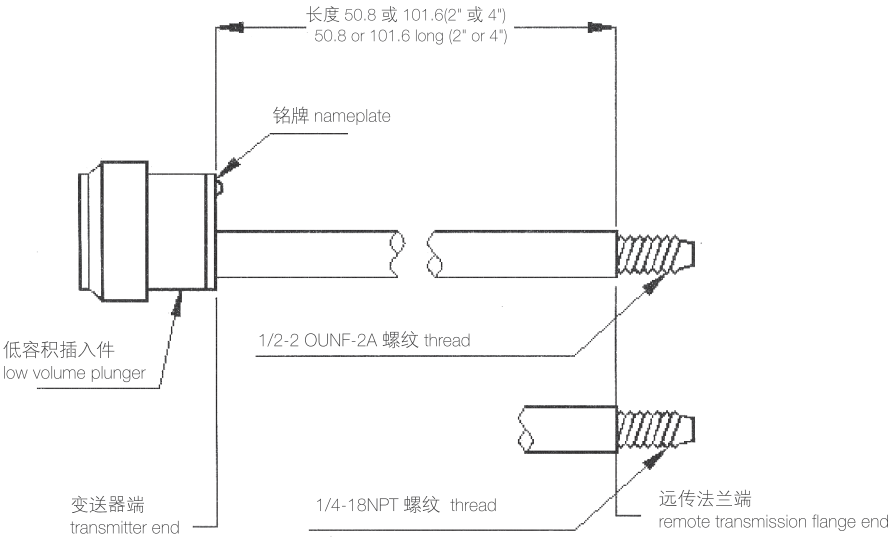
1199CLC type close coupling joint

表 7 近耦接头订货型号规格表

Table 7 specifications of nearly coupling joint

1199CLC 型 type 1199CLC	近耦接头 nearly coupling joint			
	代号 code	近耦接头配件材料和尺寸 material and size of the joint		
	11	316SsT 不锈 stainless steel, 0.71n1n(0.028") 内径 inner diamter		
	代号 code	变送器末端配件 transmitter end fittings		
		A 低容积法兰插入件 low volume flange plunger		
	代号 code	近耦段长度 (两配件之间) 提货款 Length of the nearly coupling section(between two parts)		
	20 40	(50.8mm)2" (101.6mm)4"		
	代号 code	远传法兰端配件 remote transmission flange end parts		
		A00 B00	1/2-20UNF-2A 螺纹 thread, 316SST 不锈钢 stainless steel 1/4-18NPT 螺纹 thread, 316SST 不锈钢 stainless steel	
1199CLC 型 model 1199CLC	11	A	40	A00 ← 典型型号 typical model

注：带近耦接头的远传法兰变送器一定要使用安装架，不要用扁平式 PFW 连用。
Notes: the remote transmission transmitter with nearly coupling joint should be installed with a mounting rack, without using flat PFW



DP/GP 型差压 / 压力变送器
DP/GP type differential pressure / pressure transmitter



3151 系列
3151 series

P-034

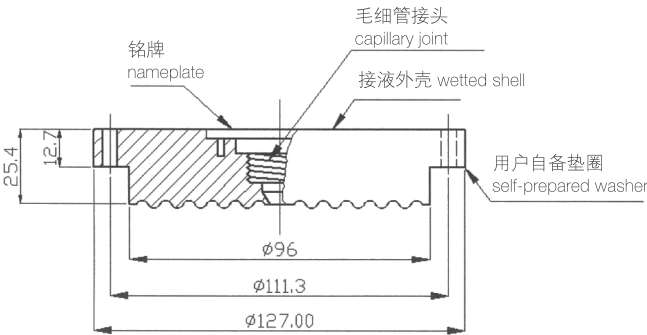
带 1199 CTW 型远传法兰的 3151 差压 / 压力变送器

3151 differential pressure / pressure transmitter with
1199CTW type remote flange

表 8 化工 TEE 型远传法兰订货规格表

Table 8 Specifications of chemical industry TEE type remote transmission flange

1199CTW 型		化学 TEE 型远传法兰 chemical industry TEE type remote transmission flange	
	代号 code	类型 type	
	11	标准，最大工作压力 6.89MPa(1000psi) standard, max working pressure is 6.89MPa(1000psi)	
	代号 code	膜片材料和厚度 diaphragm material and thickness	
	A	316SST 不锈钢 stainless steel, 厚度 thickness0.076mm(0.003")	
	B	哈氏合金 Hastelloy alloy C-276	
	代号 code	接液壳体材料 wetted parts material	
	11	316SST 不锈钢 stainless steel	
1199CTW	11	A	11 ← 典型型号 typical model



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P-035

DP/GP 型差压 / 压力变送器
DP/GP type differential pressure / pressure transmitter

3151 系列
3151 series

1199UCW 型管接式远传法兰

1199UCW type pipe connection remote flange

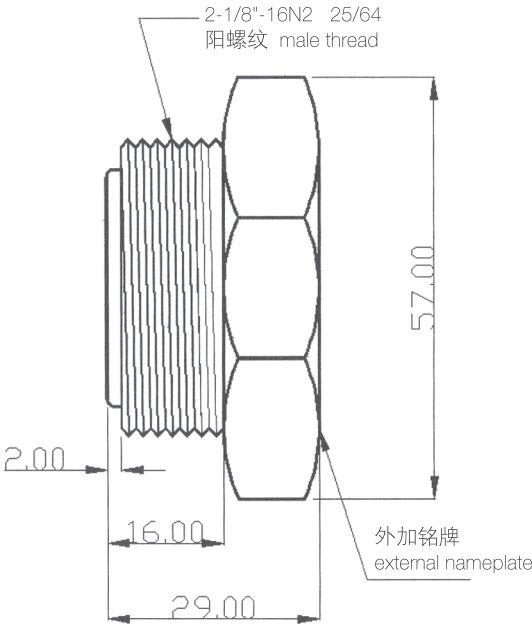
表 9 管接式远传法兰订货规格表

Table 9 specifications of pipe joint type remote flange

1199UCW 型	接管式远传法兰 pipe joint type remote flange		
	代号 code	O 型圈材料 material of O-shaped ring	
	11	聚四氟乙烯, 最高工作压力 13.78MPa(2000Psi) Polytet, max working pressure is 13.78MPa(21900Psi)	
	代号 code	膜片材料 diaphragm material	
	A	316L SST 不锈钢 stainless steel	
	代号 code	带螺母接液壳体材料 material of wetted shell with thread.	
	11	316SST 不锈钢 stainless steel	
1199UCW 型	11	A	11 ← 典型型号 typical model

1199UCW 管接式远传法兰

1199UCW pipe connection type remote flange



DP/GP 型差压 / 压力变送器
DP/GP type differential pressure / pressure transmitter



3151 系列
3151 series

P-036

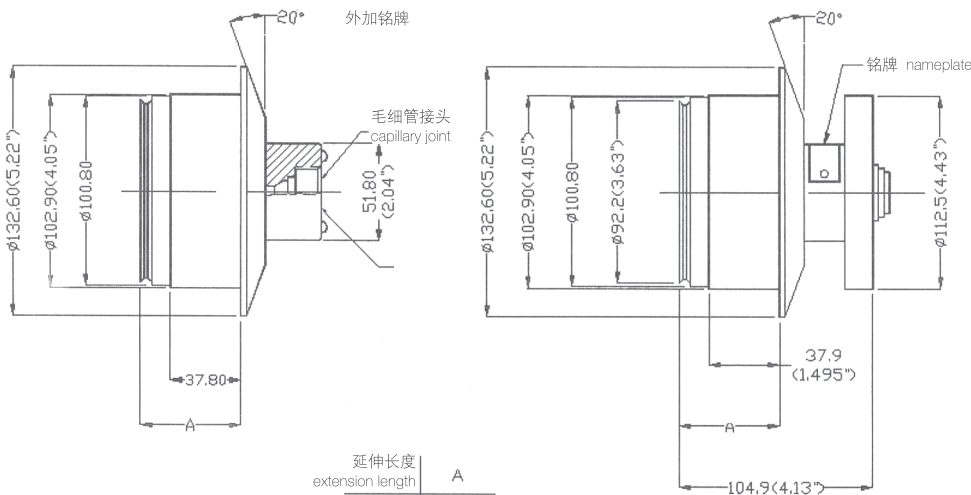
1199SSW 型防污染槽罐用销式远传兰

1199SSW type pollution-proof tank dedicated pin type remote flange

表 10 SSW 型防污染槽罐用销式远传法兰订货规格表

Table 10 specifications of SSW type anti-pollution tank pin type remote flange

1199SSW 型	防污染槽罐用销式远传法兰 anti-pollution tank pin type remote flange		
	代号 code	连接形式 connecting format	
	12	毛细管结构 capillary structure——伸长 stretch 50.8mm(2")	
	14	近耦结构 nearly coupling structure——伸长 stretch 50.8mm(2")	
	22	毛细管结构 capillary structure——伸长 stretch 152mm(6")	
	24	近耦结构 nearly coupling structure——伸长 stretch 152mm(6")	
	代号 code	膜片材料 / O 型圈材料 diaphragm material/o type ring material	
	A	316L SST 不锈钢 stainless steel / 乙 烯—丙 烯 橡 胶 ethylene-propene rubber	
	代号 code	接液壳体材料 wetted shell material	
	11	316SST 不锈钢 stainless steel	
1199SSW	12	A	11 ← 典型型号 typical model



样式 12 style12	延伸长度 extension length	A
	50.8(2")	53.0(2.11")
	15.2(6")	155.2(6.11")





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P-037

DP/GP 型差压 / 压力变送器
DP/GP type differential pressure / pressure transmitter

3151 系列
3151 series

远传法兰灌充液：

远传法兰灌充液选用应考虑使用的工作温度、灌充液的比重产生迁移量影响程度、是否会超出变送器的测量范围上下限区域等因素。

Filling liquid of remote flange：

When you select filling liquid of remote flange, you shall consider factors like the working temperature, the impact degree of the migration caused by filling liquid proportion, whether it will go beyond the upper and lower limits of the transmitter measuring range, etc.

表 11 远传法兰灌充液订货规格表

Table 11 specifications of remote flange filling liquid

代号 code	远传填充液 + remote filling liquid	比重 proportion	温度稳定范围 Stable temperature range
C	DC200 硅油 silicon oil	0.934	-40~149℃
D	DC704 硅油 silicon-oil	1.07	15~315℃
H	惰性油 inertia oil	1.85	-45~177℃

D——典型型号（选用 DC704 硅油）D——typical model (using DC704 silicon oil)

注：测真空时温度极限应降低
Notes: temperature limit should be lowered when measure the vacuum

LT 液位变送器
LT liquid level transmitter



3151 系列
3151 series

P-038

3151 系列
LT 液位变送器

3151 series
LT liquid level transmitter

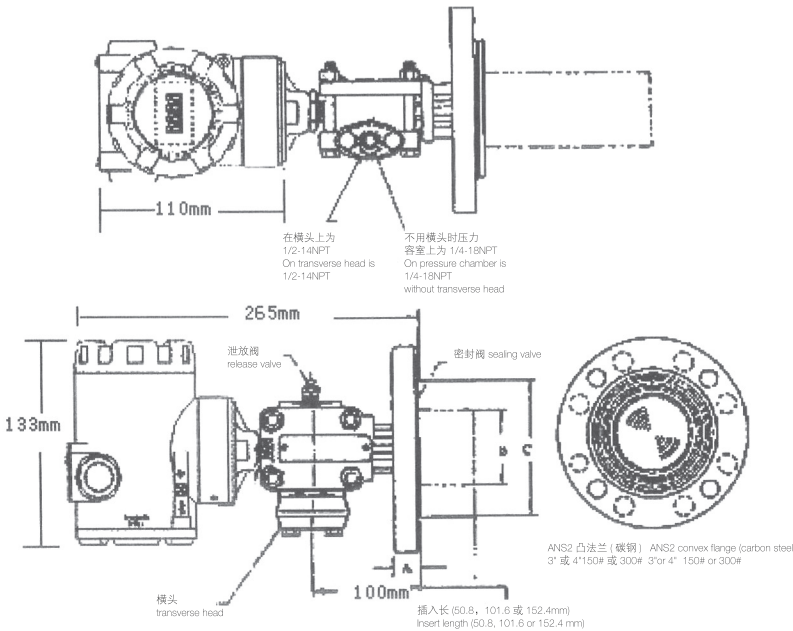


3151 系列 LT 液位变送器有平法兰、插入式法兰供用户选用 (见选型编码表), 其尺寸大小为 3 寸和 4 寸, 压力额定值为 150#(工作压力 1.9MPa) 和 300#(工作压力 5.1MPa)。哈氏合金 C 或钽膜片材料法兰可使用于腐蚀介质之中。

3151 series LT liquid level transmitter includes two models: flat flange and plug-in type flange(you can refer to model selection code table), the responding size is 3 cun and 4 cun, the pressure rating is 150# (working pressure is 1.9MPa) and 300# (working pressure is 5.1MPa). Flange of Hastelloy alloy-C or Ta diaphragm is corrosion resistant.

外形尺寸图

Outline dimensional drawing





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P-039

LT 液位变送器

LT liquid level transmitter

3151 系列
3151 series

法兰参数表 flange parameters table

法兰尺寸 flange size							螺栓孔 bolt hole		
订货号 order number	尺寸 size	压力额定值 pressure rating	外径 Outer diameter	A	B	C	螺栓数量 Bolts quantities	孔分布直径 Hole diameter distribution	孔径 Bore diameter
A	3"	150#	Φ 190.5 (7 ¹ / ₂ ")	30.2 (1 ³ / ₁₆ ")	Φ 65.5 (2.58")	Φ 127 (5")	4	Φ 152.4 (6")	Φ 19.1 (³ / ₄ ")
B	4"	150#	Φ 228.6(9")	30.2 (1 ³ / ₁₆ ")	Φ 88.9 (3.5")	Φ 157.2 (6 ³ / ₁₆ ")	8	Φ 190.5 (7 ¹ / ₂ ")	Φ 19.1 (³ / ₄ ")
C	3"	300#	Φ 209.6 (8 ¹ / ₄ ")	34.9 (1 ³ / ₈ ")	Φ 65.5 (2.58")	Φ 127 (5")	8	Φ 168.3 (6 ⁵ / ₈ ")	Φ 22.2 (⁷ / ₈ ")
D	4"	300#	Φ 254 (10")	38.1 (1 ¹ / ₂ ")	Φ 88.9 (3.5")	Φ 157.2 (6 ³ / ₁₆ ")	8	Φ 200 (7 ⁷ / ₈ ")	Φ 22.2 (⁷ / ₈ ")

LT 液位变送器
LT liquid level transmitter



3151 系列
3151 series

P-040

3151LT 液位变送器选型编码

3151LT liquid level transmitter model selection code

3151 系列代码 code		变送器选型代码 transmitter model selection code				选用项 Optional
测量类型 measuring type	LT	液位变送器 level transmitter				
可调试的量程范围 (kPa) adjustable range scope		4	0-0.4~40 注：使用 1kPa 以下量程须在订货合同中注明。Notes: mark out if used in range below 1kPa			
		5	0-2~200			
		6	0-7~700			
推荐使用量程 (kPa)		4	0-4~40			
		5	0-20~200			
		6	0-70~700			
输出信号型式		A	4~20mA 直流信号 +HART 协议数字信号 (单参数显示) 4~20mA DC signal+ HART protocol digital signal (single-parameter display)			选用 optional
		B	4~20mA 直流信号 +HART 协议数字信号 (多参数显示) 4~20mA DC signal+ HART protocol digital signal (multi-parameter display)			
		E	工业以太网协议的数字量信号 digital signal of industrial ethernet protocol			
		F	FF 基金会现场总线协议的数字量信号 FF bus protocol digital signal			
		P	Prpibus-PA 协议的数字量信号 protocol digital signal			
高压侧法兰型式 high pressure side	代号 code	尺寸 Size	插入长度 Insert length	法兰膜片及插入筒材料 Flange diaphragm and material of insert cylinder		选 用 optional
	A0	3"	平	316SST 不锈钢 stainless steel		
	A2	3"	50.8mm	316SST 不锈钢 stainless steel		
	A4	3"	101.6mm	31688T 不锈钢 stainless steel		
	A6	3"	152.4mm	316SST 不锈钢 stainless steel		
	B0	4"	平	316SST 不锈钢 stainless steel		
	B2	4"	50.8mm	316SST 不锈钢 stainless steel		
	B4	4"	101.6mm	316SST 不锈钢 stainless steel		
	B6	4"	152.4mm	3168ST 不锈钢 stainless steel		
	C0	3"	平	哈氏合金 Hastelloy alloy		
	C2	3"	50.8mm	哈氏合金 Hastelloy alloy		
	C4	3"	101.6mm	哈氏合金 Hastelloy alloy		
	C6	3"	152.4mm	哈氏合金 Hastelloy alloy		
	D0	4"	平	哈氏合金 Hastelloy alloy		
	D2	4"	50.8mm	哈氏合金 Hastelloy alloy		
	D4	4"	101.6mm	哈氏合金 Hastelloy alloy		
	D6	4"	152.4mm	哈氏合金 Hastelloy alloy		
	E0	3"	平	钽 tantalum		
	F0	4"	平	钽 tantalum		
安装法兰型式 Flange installation type		A	3", 150#, 与高压侧法兰型式配合选用, 碳钢 3",150#, Matched with high pressure side flange type ,carbon steel			选 用 optional
		B	4", 150#, 与高压侧法兰型式配合选用, 碳钢 4",150#, Matched with high pressure side flange type ,carbon steel			
		C	3", 300#, 与高压侧法兰型式配合选用, 碳钢 3",300#, Matched with high pressure side flange type ,carbon steel			
		D	4", 300#, 与高压侧法兰型式配合选用, 碳钢 4",300#, Matched with high pressure side flange type ,carbon steel			
负压侧部件材料 material of negative pressure side components		22	316L ssT 传感器隔离膜片 sensor isolation diaphragm 316 SST 流程法兰 process flange、泄放阀 release valve、选用接头 selected joint 氟碳橡胶 接液 “O” 形密封圈 fluorocarbon rubber wetted O-shaped sealing ring 灌充液 硅油 filling liquid silicon oil 灌充液 硅油 filling liquid silicon oil			选 用 optional
		25	钽材料传感器隔离膜片、tantalum sensor isolation diaphragm 316 SST 流程法兰 process flange、泄放阀 release valve、选用接头 selected joint 氟碳橡胶接液 “O” 形密封圈 fluorocarbon rubber wetted O-shaped sealing ring 灌充液 硅油 filling liquid silicon oil			

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P-041

LT 液位变送器

LT liquid level transmitter

3151 系列
3151 series

3151LT 液位变送器选型编码 (续)

3151LT liquid level transmitter model selection code(二)

负压侧流程法兰接头型式 Negative pressure side flow method Flange joint type	0	1 / 4-18 NPT 内螺纹 female thread			选用 optional	
	T	1 / 2 14 NPT 内螺纹 female thread				
高压侧接液法兰灌充液 flange filling liquid	C	Dc704 硅油 silicon oil		灌充液技术性能见表 11 technical performance of filling liquid please refer to table 11	选用 optional	
	D	Dc200				
	H	惰性油 inert oil				
显示器件型式	M20	指针显示 0~100%线性刻度 (输出 4~20mA 的变送器可选) the indicator displays linear scale of 0~100%(transmitter output 4~20mA is optional)			选用 optional	
	M7	LCD(液晶) 显示 , 可设置循环或固定显示压力、温度、电流、百分比与测量工程量单位等多种模式。 OLED 显示 , 中文显示界面 (回路增加压降 ≤6.5V) LCD display, can be set into many modes like cycle, regular display of pressure, temperature, current, percentage and measuring engineering unit, etc				
	M28	同时显示压力、温度、电流、百分比与测量工程量单位。Display pressure, temperature, current, percentage and measuring engineering unit engineering unit at the same time.				
	M30	LED 数字显示百分比量程 (4~20mA 回路增加压降 ≤3V) LED digital display percentage range (4~20mA loop pressure increase and reduce is ≤3V)				
	M32	LE 数字显示 , 可按需设定 (4~20mA 回路增加压降 ≤3V) LED digital display, set according to requirements (4~20mA loop pressure increase and reduce is ≤3V)				
防爆型式 explosion-proof type	d	ExdIICT6(隔爆型 explosion-proof type)			选用 optional	
	i	Exia II CT6(本安型 intrinsic safety type)				
抗电源干扰型式 (本安防爆型不能用) anti power interference type (intrinsic safety explosion-proof type is unusable)		k	安装内置式电源隔离模块 with built-in type power supply isolation module			选用 optional
引压接头 pressure inlet joint		C12	一端为 1 / 2-14NPT 螺纹 , 另一端为外径 14mm , 内径 6mm 连接管用于与其它管道焊接 , 两端为可拆卸式螺纹连接。 One end is 1 / 2-14NPT thread, the other end is connection tube with 14mm outer diameter and 6mm inner diameter, which is used to weld with other pipes. Both ends are detachable thread connection.			选用 optional